Water Column Injury Ephemeral Data Collections:
Deepwater Horizon Oil Spill (DWHOS)

Plan for Adaptive Water Column NOAA-NRDA Sampling (PAWNNS)
Cruise Plan – HOS Davis 3 Addendum

December 1, 2010

Prepared by: Deborah French-McCay (ASA)

Proposed Cruise Dates (Extension from original plan):

HOS Davis 3 – September 8-29, 2010

Background/Justification

This plan is for an extension to the HOS Davis 3 cruise, originally planned for September 8-20, 2010. The mission will be a continuation of the sampling efforts of the first leg of the HOS Davis 3 cruise, which was completed September 17 when a crew change required the vessel come in to port. Thus, the main plan and all of the attachments to the HOS Davis 3 plan are appended here by reference and without change.

In addition to the water sampling and sensor measurements using the ROV (as described in the main plan), videos of the seafloor and a shakedown of techniques for sampling the sediment will be performed. We will attempt to retrieve samples of opportunity of epibenthic macrofauna or other biota. In addition to soft bottom areas, potential hard bottom areas will be targeted and surveyed with the ROV. Hard bottom areas are thought to have high habitat complexity, therefore making them areas of special interest. Deep water hard bottom habitat in the Gulf of Mexico can be associated with a variety of epifaunal organisms including deep coral species and seep communities (tube worms, mussels, etc.). Attachment 19 describes methods and protocols for these activities. Attachment 18 (MC252 Analytical Quality Assurance Plan (QAP), Section 1.0) details the SOPs and chemical analyte list to be measured.

Sampling Plan for the HOS Davis Cruise 3, Leg 2

Sampling data will be collected at stations placed in and surrounding areas thought to have deepwater and surfacing water masses containing oil released from the incident site. The design will be to sample down-current from the source. The locations will be focused in areas identified by:

A. The cumulative down-current direction (over time), as indicated by transport modeling using the current data measured at the DeepDriller III ADCP, the ADCP array deployed at 3 nmiles west of the Wellhead, and other ADCPs in nearby areas. Transport modeling will include rising speeds

using modified Stokes Law for assumed droplet size distributions based on measured and estimated droplet sizes.

B. Targets identified with CTD, DO, and/or fluorescence measurements, both on the cruise and from other vessels (at time or in previous cruises). For example, fluorescence profiles and other sensors have indicated the presence of oil between 1000 and 1400 m,.

C. Locations fitting critera B and also identified as hard bottoms by analyses performed previously by MMS (now BOEMRE) that are in these areas (identified in bullet A and B), as shown in Figures 1-2 and Tables 1-2. These sites were derived by MMS via seismic data surveys conducted in the Gulf of Mexico. The areas noted in Figure 1 represent hard bottom anomalies that were evident in the data set. Several of these sites have been confirmed as seep and/or deep water hard bottom communities during the Lophelia II (2009) and Chemo III (2009) projects.

D. Epibenthic macrofauna will be collected opportunistically when observed with the ROV (as a test of methods for performing such sampling with the ROV available on the HOS Davis).

Locations fitting the above criteria were in locations 1000-1500m deep, and all stations listed in Tables 1 and 2 in this depth range were targeted for sampling.

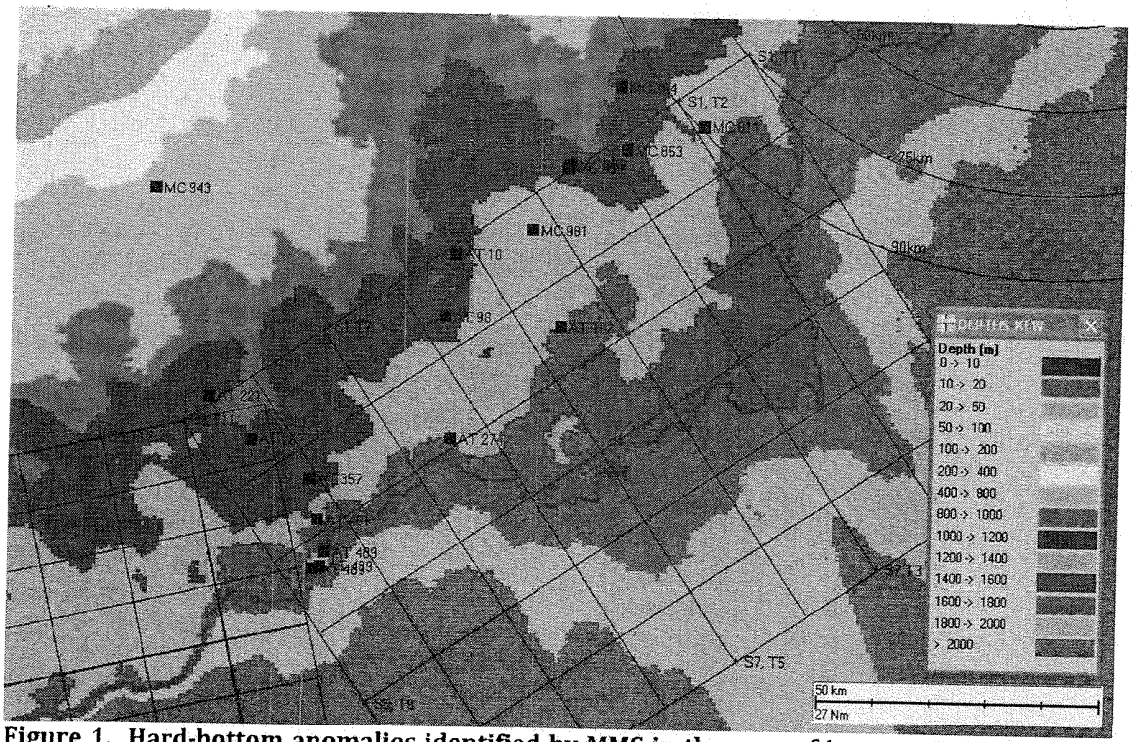

Figure 1. Hard-bottom anomalies identified by MMS in the area of interest SW of the well. The Subsurface Monitoring Unit grid for Mission Guidance is overlaid for orientation.

Table 1. Hard-bottom anomalies identified by MMS in the area of interest SW of the well.

Site	North	West	Depth (m)
MC 764	28.222580	-89.152670	1157.
MC 811	28.162730	-89.001280	1342.
MC 850	28.099360	-89.243440	1174.
MC 850	28.094290	-89.246300	1169.
MC 853	28.122690	-89.139080	1161.
MC 943	28.050130	-89.995310	1444.
MC 981	28.992880	-89.309100	1381.
AT 10	28.953430	-89.448180	1198.
AT 98	28.851570	-89.465730	1196.
AT 102	27.837010	-89.254180	1521.
AT 221	27.718800	-89.890900	1113.
AT 267	27.649980	-89.811980	1137.
AT 274	27.654000	-89.450920	1538.
AT 357	27.586510	-89.704310	1141.
AT 401	27.519830	-89.690570	1388.
AT 489	27.440190	-89.697480	1516.
AT 489	27.445920	-89.683300	1469.
AT 489	27.468400	-89.676650	1504.

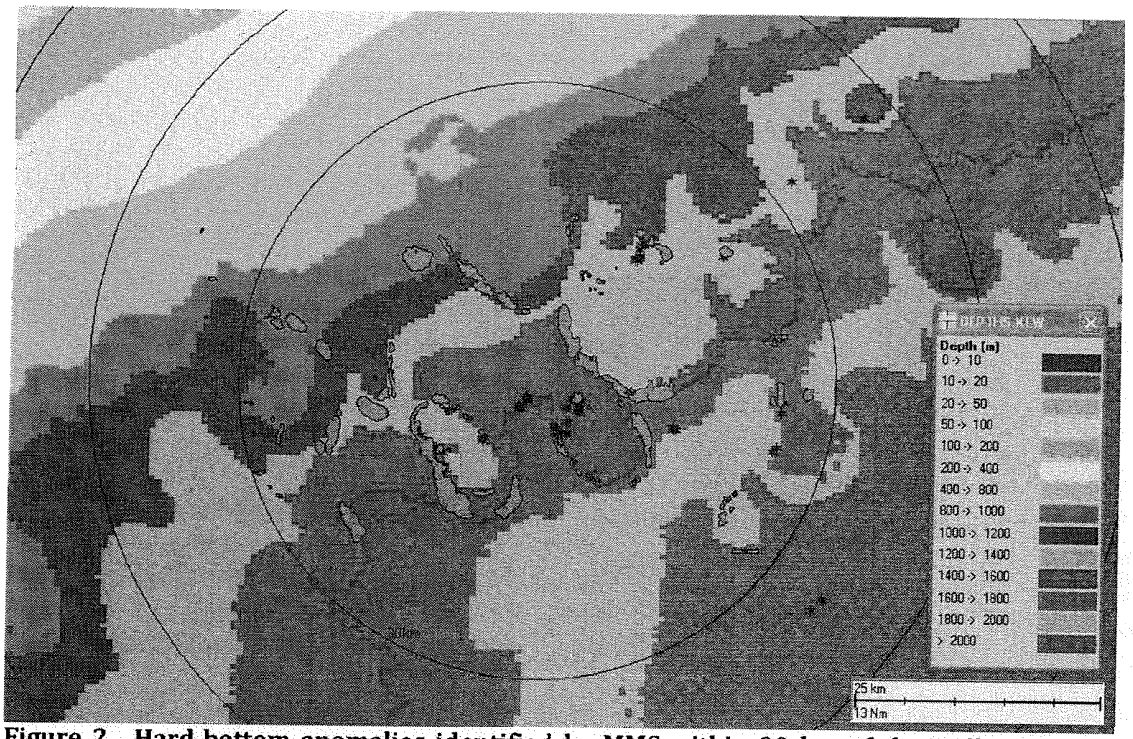

Figure 2. Hard-bottom anomalies identified by MMS within 30 km of the well and seeps (blue stars) identified in Pisces cruises in Aug 2010.

Table 2. Hard-bottom anomalies identified by MMS in the area of interest 4-8 nmiles SW of the well.

Water Depth	No.	Direction/Distance From BP Well	Block #	Latitude	Longitude
4520'	9	SW (4.74 mi)	MC 295	N 28.70455°	W 88.43388°
4400' =1341m	10	W-SW (6.00 mi)	MC 250	N 28.72133°	W 88.4626°
4420'	11	W-SW (8.2 mi)	MC 294	N 28.69757°	W 88.49326°
4290'	12	W-SW (8.0 mi)	MC 294	N 28.68112°	W 88.48076°

4440'	13	SW (7.28 mi)	MC 294	N 28.67830°	W 88.46483°
4450'	14	SW (8.16 mi)	MC 338	N 28.65983°	W 88.46737°

Personnel

8 NOAA contractors:

- Dr. James Payne (PECI), Chief Scientist
- LISST technician: Audra Burchfield (Dial Cordy)
- Acoustics (ABS) technician: Adam Spears (Green Eyes Observing)
- 2 NOAA Water Samplers: Velu Ochoa (Dial Cordy), Lucas Curci (AIS)
- 1 NOAA Data Manager: Jessica Childs

3-4 ROV Technicians
1 Operation Supervisor (CSA)
1 Survey/Navigation technician (CSA)
2 field technicians (CSA)
1 ENTRIX employee
Boat Crew (Captain, mate, deck hands)

Vessel

Operations will be conducted on the HOS Davis.

Estimated Additional Costs (September 21-29):

HOS Davis Cruise 3 Extension Costs	Hrs/Days/Trips	Day/Hr Rate	Total
HOS M/V Davis Mobilization / Preparation			
CSA Labor	[redacted]		$14,196
CSA Mobilization			$30,000
SubTotal			**$44,196**

Field Survey Costs	Hrs/Days/Trips	Day/Hr Rate	Total
HOS M/V Davis	[redacted]		$801,693
Estimated Fuel and Lube			$104,500
NOAA Labor (days):			
Jim Payne			$25,000
CTD Technician			$20,000
ABS Technician			$10,000
LISST Technician			$15,000
Water Sampler			$10,000
Water Sampler			$10,000

Data Manager	[redacted]		$17,500
Entrix Labor (days):			
Entrix			(provided elsewhere)
Misc Costs Sample Handling	1	$11,000	$11,000
SubTotal			**$ 1,024,693**
TOTAL			**$ 1,068,889**

Days/Trips based on 1/dy Mob, 10dys Fid, 1dy demob
Labor is estimated cost and hours

Budgeting

The Parties acknowledge that this budget is an estimate, and that actual costs may prove to be higher due to a number of potential factors. As soon as factors are identified that may increase the estimated cost, BP will be notified and a change order describing the nature and cause for the increase cost in addition to a revised budget for BP's consideration and review.

Safety Plans

BP's full operations and safety plan is attached to the main plan as Attachment 14. In addition, the NOAA incident site safety plan (which all NOAA employees and contractors must sign prior to the cruise) is attached to the main plan as Attachment 12.

Transfer of the shared electronic media in the onboard equipment to each of the party's hardware for retention and use.

Upon return to port, the vessel Operations Manager shall produce identical copies of the raw and processed electronic media generated during the cruise and deliver one of those copies each to NOAA (or its QA contractor) and to ENTRIX.

Laboratory

All VOC and water chemistry samples (filters and water samples) for PAH will be sent to Alpha Analytical Laboratories in Mansfield, MA. Sediment samples will be sent to Alpha Analytical for detailed chemical analyses and fingerprinting (Sediment/Soil for PAH, SHC/THE). The RP may take additional unfiltered and toxicity water samples at selected locations, which are not part of the cooperative sampling. These samples will be sent to a laboratory of their choosing. ENTRIX will provide all related sampling supplies for their samples. Some of these unfiltered water samples may also be used for TSS/CHN, PAH/TPH, and dispersant analyses. If such sampling, analyses and/or toxicity testing are completed, the data will be shared with NOAA and other trustees. Samples of opportunity of epibenthic macrofauna or other biota collected by the ROV will also be sent to Alpha Analytical Laboratories in Mansfield, MA and archived. Analytical tissue analyses to be carried out are not planned at present.

Distribution of Laboratory Results

Each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this work plan as a Laboratory Analytical Data Package (LADP) to the trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana and to ENTRIX (on behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO and to ENTRIX. Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Quality Assurance Project Plan, after which time the validated/QA/QC'd data shall be made available to all trustees and ENTRIX. Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Quality Assurance Project Plan and the issue and results shall be distributed to all parties. In the interest of maintaining one consistent data set for use by all parties, only the validated/QA/QC'd data set released by the DMT shall be considered the consensus data set. The LADP shall not be released by the DMT, LOSCO, BP or ENTRIX prior to validation/QA/QC absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all trustees and ENTRIX.

Attachments for Extension:
Attachment 18. MC 252 Analytical QAP V2.1.pdf (same as for original HOS Davis 3 plan)
Attachment 19. ROV Sediment Core and Biota Collection

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Plan Date: December 1, 2010

Approvals

Approval of this work plan is for the purposes of obtaining data for the Natural Resource Damage Assessment. Parties each reserve its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan.

Robin Bullock | Robin Bullock | 12/4/10

BP Representative Signature | Name | Date

Jennifer Boyce | Jennifer Boyce | 12/2/10

Federal Representative Signature | Name | Date

FOR ROLAND GUIDRY | KAROLIEN DEBUSSCHERE | 3/28/11

Louisiana Representative Signature | Name | Date